

In the Claims:

Please amend claims 4, 7-15, 31-33, 38, 41-43. Please cancel claims 1, 6, 16-30, 34-37, 39 and 40.

The claims are as follows:

1-3 (Canceled)

4. (Currently Amended) The method of claim ~~[[32]]~~ 41, wherein said inert gas is helium and said reducing gas is hydrogen, ammonia, ~~a mixture of hydrogen and nitrogen, a mixture of ammonia and nitrogen or a mixture of hydrogen~~~~[[,]]~~ and ammonia ~~and nitrogen~~.

5-6 (Canceled)

7. (Currently Amended) The method of claim ~~[[1]]~~ 41, wherein said substrate includes a bulk silicon or silicon on a insulator substrate and said forming a silicon dioxide layer is formed by a process selected from the group consisting of native oxide growth in air or oxygen, thermal oxidation, rapid thermal oxidation, chemical vapor deposition and oxidizing cleaning processes.

8. (Currently Amended) The method of claim ~~[[1]]~~ 41, wherein said silicon dioxide layer has a thickness of about 8 to 23 Å.

9. (Currently Amended) The method of claim ~~[[1]]~~ 41, wherein said silicon oxynitride has a thickness of about 8 to 24 Å.

10. (Currently Amended) The method of claim [[1]] 41, wherein said silicon oxynitride film contains between about 2 and 20 percent nitrogen.

11. (Currently Amended) The method of claim [[1]] 41, wherein the concentration of nitrogen in said silicon oxynitride layer is between about $1\text{E}21$ and $1\text{E}22$ atm/cm³.

12. (Currently Amended) The method of claim [[1]] 41, wherein the step of performing a plasma nitridation imparts a dose of nitrogen in between about $1\text{E}14$ and $5\text{E}14$ atm/cm² to said silicon dioxide layer.

13. (Currently Amended) The method of claim [[1]] 41, wherein said silicon oxynitride layer has a thickness of about 0 to 35% greater than the thickness of said silicon dioxide layer.

14. (Currently Amended) The method of claim [[1]] 41, wherein the mean thickness of said silicon oxynitride layer varies by no more than about one-half angstrom sigma from a center to an edge of said substrate.

15. (Currently Amended) The method of claim [[1]] 41, wherein the nitrogen concentration of said silicon oxynitride layer varies by not more than about 25% from a center to an edge of said substrate.

16-30 (Canceled)

31. (Currently Amended) The method of claim [[1]] 41, further including:

exhausting said second chamber through said first chamber.

32. (Currently Amended) The method of claim [[1]] 41, further including:

~~generating a nitrogen, inert gas and reducing gas plasma in said second chamber from nitrogen, an inert gas and a reducing gas; and~~

transferring said ~~nitrogen~~, inert gas ions and reducing gas ions ~~plasma~~ from said second chamber into said first chamber through said first inlet port of said first chamber.

33. (Currently Amended) The method of claim [[1]] 41, wherein said ~~inert gas is helium and said reducing gas is deuterium, deuterated ammonia, a mixture of deuterium and nitrogen, a mixture of deuterated ammonia and nitrogen, a mixture of deuterium[,]] and deuterated ammonia and nitrogen, or a mixture of deuterium[,]] and ammonia and nitrogen.~~

34-37 (Canceled)

38. (Currently Amended) The method of claim [[1]] 41, wherein said nitridation plasma is generated by radio frequency excitation.

39-40 (Canceled)

41. (Currently Amended) ~~The method of claim 40,~~ A method of fabricating a gate dielectric layer, comprising:

forming a silicon dioxide layer on a top surface of a substrate;

placing said substrate in a first chamber having a first inlet port and a second inlet port;

generating a plasma in a second chamber, said plasma comprising at least one nitridation species, said second chamber adjacent to said first chamber, said second chamber connected to said first chamber by said first inlet port in said first chamber;

transferring said nitridation species of said plasma from said second chamber to said first chamber through said first inlet port;

performing a plasma nitridation in said first chamber using said nitridation species in a reducing atmosphere to convert said silicon dioxide layer into a silicon oxynitride layer; and

wherein said plasma comprises ions of nitrogen, ions of an inert gas and

~~wherein said plasma further comprises ions of a reducing gas.~~

42. (Currently Amended) The method of claim ~~[[1]]~~ 41, ~~wherein said plasma comprises ions of nitrogen and ions of inert gas is helium.~~

43. (Currently Amended) The method of claim 42, ~~wherein said plasma further comprises ions of reducing gas is hydrogen.~~

44. (Previously Presented) A method of fabricating a gate dielectric layer, comprising:

forming a silicon dioxide layer on a top surface of a substrate;

placing said substrate in a first chamber; ~~and~~

introducing a nitrogen containing gas, an inert gas and a reducing gas into a second chamber and generating a nitrogen, inert gas and reducing gas plasma in said second chamber;
transferring said plasma from said second chamber into said first chamber, nitrogen species in said plasma converting said silicon dioxide layer into a silicon oxynitride layer.

45. (Previously Presented) A method of fabricating a gate dielectric layer, comprising:

forming a silicon dioxide layer on a top surface of a substrate;
placing said substrate in a first chamber;
introducing a nitrogen containing gas and an inert gas into a second chamber and generating a nitrogen and inert gas plasma in said second chamber;
simultaneously (i) transferring said plasma from said second chamber into said first chamber through a first inlet port connecting said first chamber to said second chamber and (ii) introducing a reducing gas into said first chamber through a second inlet port in said first chamber, nitrogen species in said plasma converting said silicon dioxide layer into a silicon oxynitride layer.